

(19) World Intellectual Property Organization  
International Bureau(43) International Publication Date  
2 October 2003 (02.10.2003)

PCT

(10) International Publication Number  
WO 03/080886 A1(51) International Patent Classification<sup>7</sup>: C22C 38/44

(21) International Application Number: PCT/KR03/00568

(22) International Filing Date: 24 March 2003 (24.03.2003)

(25) Filing Language: Korean

(26) Publication Language: English

(30) Priority Data:  
10-2002-0016214 25 March 2002 (25.03.2002) KR

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(81) Designated States (national): AE, AG, AL, AM, AT, AU, AZ, BA, BB, BG, BR, BY, BZ, CA, CH, CN, CO, CR, CU, CZ, DE, DK, DM, DZ, EC, EE, ES, FI, GB, GD, GE, GH, GM, HR, HU, ID, IL, IN, IS, JP, KE, KG, KP, KZ, LC, LK, LR, LS, LT, LU, LV, MA, MD, MG, MK, MN, MW, MX, MZ, NO, NZ, OM, PH, PL, PT, RO, RU, SC, SD, SE, SG, SK, SL, TJ, TM, TN, TR, TT, TZ, UA, UG, US, UZ, VC, VN, YU, ZA, ZM, ZW.

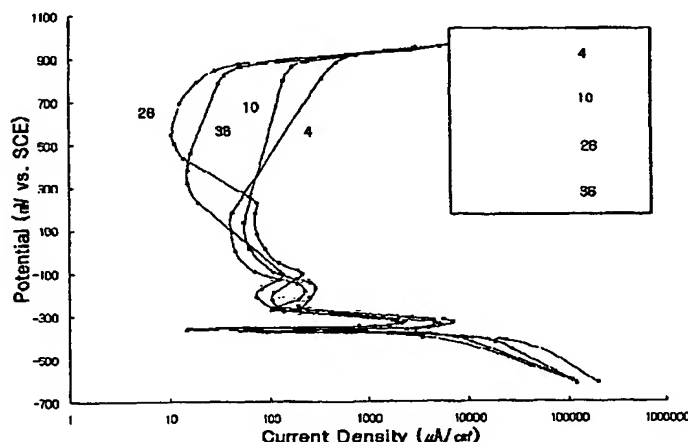
(84) Designated States (regional): ARIPO patent (GH, GM, KE, LS, MW, MZ, SD, SL, SZ, TZ, UG, ZM, ZW), Eurasian patent (AM, AZ, BY, KG, KZ, MD, RU, TJ, TM), European patent (AT, BE, BG, CH, CY, CZ, DE, DK, EE, ES, FI, FR, GB, GR, HU, IE, IT, LU, MC, NL, PT, RO, SE, SI, SK, TR), OAPI patent (BF, BJ, CF, CG, CI, CM, GA, GN, GQ, GW, ML, MR, NE, SN, TD, TG).

Published:

— with international search report

For two-letter codes and other abbreviations, refer to the "Guidance Notes on Codes and Abbreviations" appearing at the beginning of each regular issue of the PCT Gazette.

(54) Title: HIGH-GRADE DUPLEX STAINLESS STEEL WITH MUCH SUPPRESSED FORMATION OF INTERMETALLIC PHASES AND HAVING AN EXCELLENT CORROSION RESISTANCE, EMBRITTLEMENT RESISTANCE, CASTABILITY AND HOT WORKABILITY



(57) Abstract: Formation of intermetallic phases such as sigma ( $\sigma$ ) and khi ( $\chi$ ) shows detrimental effects on the corrosion and mechanical properties of high-grade duplex stainless steel. The present invention provides high-grade duplex stainless steel with much suppressed formation of intermetallic phases, of which the chemical composition consists essentially, on a weight basis, of : Cr : 21.0% ~ 38.0%, Ni : 3.0% ~ 12.0%, Mo : 1.5% ~ 6.5%, W : 6.5% or less, Si : 3.0% or less, Mn : 8.0% or less, N : 0.2% ~ 0.7%, C : 0.1% or less, at least one element selected from the group consisting of Ba : 0.0001 ~ 0.6% and one or more elements of Mischmetal (MM) and Y : 0.0001 ~ 1.0% in total, and a balance of Fe and incidental impurities. The pitting resistance equivalent has a value of  $40 \leq \text{PREW} \leq 67$  defined by the following formula (1) :  $\text{PREW} = \text{wt.}\% \text{Cr} + 3.3(\text{wt.}\% \text{Mo} + 0.5\text{wt.}\% \text{W}) + 30\text{wt.}\% \text{N}$

----- (1) The present high-grade duplex stainless steel exhibits an excellent corrosion resistance, embrittlement resistance, castability and hot workability.